

# Three new species and a key to species of the *Siobla grahami* group (Hymenoptera: Tenthredinidae) from China

Yiwen ZHANG<sup>1</sup>, Gengyun NIU<sup>2</sup>, Meicai WEI<sup>1, 2①</sup>

1. Lab of Insect Systematics and Evolutionary Biology, Central South University of Forestry and Technology, Changsha, Hunan 410004, China

2. College of Life Sciences, Jiangxi Normal University, Nanchang, Jiangxi 330022, China

**Abstract:** Three new species, namely *Siobla dianzangica* Niu & Wei **sp. nov.**, *S. melanogaster* Niu & Wei **sp. nov.**, and *S. trilineata* Niu & Wei **sp. nov.**, are described and illustrated. A key to species and distribution maps of the *Siobla grahami* group are given.

**Key words:** Tenthredinoidea; sawfly; Tenthredininae; taxonomy; distribution

中国侧跗叶蜂属光盾侧跗叶蜂种团三新种暨已知种检索表（膜翅目：叶蜂科）

张译文<sup>1</sup>，牛耕耘<sup>2</sup>，魏美才<sup>1, 2①</sup>

1. 中南林业科技大学昆虫系统与进化生物学实验室，湖南 长沙 410004；2. 江西师范大学生命科学学院，江西 南昌 330022

**摘要：**记述中国侧跗叶蜂属光盾侧跗叶蜂种团 *Siobla grahami* group 3 新种：滇藏侧跗叶蜂 *Siobla dianzangica* Niu & Wei **sp. nov.**，窄腹侧跗叶蜂 *S. melanogaster* Niu & Wei **sp. nov.**，和三条侧跗叶蜂 *S. trilineata* Niu & Wei **sp. nov.**。编制了光盾侧跗叶蜂种团 *Siobla grahami* group 已知种分种检索表及地理分布图。

**关键词：**叶蜂总科；叶蜂；叶蜂亚科；分类；分布

## Introduction

*Siobla* Cameron, 1877 was divided into nine species groups by Niu & Wei (2010). Among the nine groups, the *S. grahami* group is unique, represented by 12 valid species, and characterized by the polished anterior slope of the mesoscutellum.

The species of the *S. grahami* group are distinguished from other *Siobla* species by the following characters: mesoscutellum obtusely elevated, anterior slope shiny and without punctures in most species except *S. davidi*, *S. fulvitarisus*, and *S. scapeata* sparsely punctured; the posterior slope of mesoscutellum with distinct punctures; abdominal tergites shiny with few punctures on apical tergites, without microsculptures or with very weak microsculptures; a longitudinal carina present on abdominal tergites in some species, impunctate near carina; wings in most species infusate at the apex to a varying degree; antenna slender, about as long

Accepted 16 March 2020. Published 25 June 2020. Published online 26 May 2020.

① Corresponding author, E-mail: weimc@126.com

as the abdomen, not enlarged at apical half; body black with the pale macula, mesoscutellum usually pale, hind trochanter black; hairs pale in both sexes; lancet normal (Fig. 3), serrulae weakly protruding, annular sutures vestigial; valviceps of penis valve narrowing towards the apex (Fig. 4).

Unlike the majority of *Siobla* species groups (Niu & Wei 2010, 2013; Niu *et al.* 2012), the interspecific differences within the *S. grahami* group are limited, especially in puncture status, which is one of the key characters in the *S. metallic* group (Niu *et al.* 2012); and in the status of the mesoscutellum, which is a vital character in almost all other groups (Niu & Wei 2010, 2013). The structure of genitalia in both sexes is quite similar and the differences between species are difficult to judge. The practical diagnostic character is the body color pattern. Otherwise, intraspecific variation is rarely observed.

The *S. grahami* group distributes in the east of Asia. One species is found in Guizhou, China; one distributes in Gansu, Shaanxi, Hubei, Sichuan, Hunan, Fujian, Guangxi, and Guizhou, and the remaining species all distribute in Yunnan and Tibet in China, north of Myanmar, and east and north of India (Fig. 5).

Here we describe three new species in the *S. grahami* species group from China and present a revised identification key to the 15 species of *S. grahami* group.

## Material and methods

Adult images in Figs. 1 and 2 were taken with a Nikon D700 digital camera, and the series of images were montaged using Helicon Focus (©HeliconSoft). Images in Fig. 3 and Fig. 4 were taken with a dissection microscope. All images were further processed with Adobe Photoshop CS 6.0. The terminology follows Niu & Wei (2010).

The geographical base map of China map was downloaded from the website: National Earth System Science Data Center, National Science & Technology Infrastructure of China (<http://www.geodata.cn>). The distribution maps were prepared using the software DIVA-GIS (<http://www.diva-gis.org>), and the data in shapefiles were transformed from geographic coordinates into Asia Lambert Conformal Conic projection (ESRI: 102012). Place names of the Xizang Autonomous Region follow Wu (1995).

Genetic distances were calculated to quantify sequence divergences among individuals using Kimura's (1980) two-parameter (K2P) models, implemented in MEGA7 (Kumar *et al.*, 2015).

The depository for each holotype is given. Other specimens, including the paratypes of these new species are deposited in the Asian Sawfly Collection, Nanchang, China (ASC). Original figures are available on figshare: 10.6084/m9.figshare.7011248.

## Taxonomy

### Key to species of the *Siobla grahami* group

1. Anterior slope of mesoscutellum sparsely punctured ..... 2
- . Anterior slope of mesoscutellum impunctate ..... 4
2. Female and male. Abdominal tergites 1 to 3 largely yellowish brown. North India .....  
..... *S. scapeata* Saini & Bharti

- Male. Abdominal tergites 1 to 3 black except 2 small spots on the side of 2nd abdominal tergite..... 3
- 3. Fore wing evenly infusate. North India ..... *S. fulvitarus* Saini & Vasu
- Apical half of forewing distinctly darker than basal half. North India.....  
..... *S. davidi* Saini & Vasu (Figs. 1C, 4A, B)
- 4. Antenna black entirely, apical 3 to 4 antennomeres dark brown sometimes..... 5
- Antenna white or yellow at apical half..... 7
- 5. Female and male; posterior margin of pronotum, mesoscutellum, hind tibia, pterostigma in female, and most of pterostigma in male, yellowish; at least lateral sides of 2nd and 3rd abdominal tergites yellow. China (Yunnan); India (Assam, Meghalaya, Manipur, Sikkim, West Bengal) .....  
..... *S. turneri* Malaise (Figs. 2G, H, 3M, N, 4Q, R)
- Female and male; narrow posterior margin of pronotum dark brown; pterostigma, mesoscutellum and hind tibia black; abdominal tergites black, spots on lateral sides of 1st or 2nd tergites, if exist, very small ..... 6
- 6. Male; wings hyaline, apices weakly infusate (female unknown). China (Yunnan); India (Meghalaya, West Bengal) ..... *S. indica* Saini & Bharti (Figs. 1I, 4I, J)
- Female and male; wings yellowish hyaline, distinctly infusate at apices. China (Yunnan); India (Nagaland, Uttarakhand, Manipur, Sikkim, West Bengal, Meghalaya); Vietnam .....  
..... *S. punctata* (Cameron) (Figs. 2E, F, 3I, J, 4O, P)
- 7. Mesoscutellum and metascutellum black. Male. North India ..... *S. varia* Saini, Blank & Smith
- Mesoscutellum and metascutellum white or yellow brown. Female and male ..... 8
- 8. Hind femur, hind tibia and tarsus yellowish brown, apical part of hind femur with an obscure dark spot. Female. China (Tibet); India (West Bengal) .....  
..... *S. darjeelingia* Saini, Singh, Singh & Singh (Figs. 1B, 3A, B)
- Hind femur largely black, hind tibia with distinct black macula. Female and male..... 9
- 9. Abdominal tergite 2 largely black, lateral side with a white spot ..... 10
- Abdominal tergite 2 white or yellow brown, narrow anterior and posterior margins sometimes black ..... 11
- 10. Forewing hyaline; hind tarsus yellow brown; malar space broader than diameter of ocellus; temple and postocellar area very sparsely punctured, flat interspaces broader than diameter of a puncture. Female. N. E. India..... *S. bengalensis* Saini, Singh, Singh & Singh (Fig. 1A)
- Apical half of forewing deeply and basal half faintly infusate; hind basitarsomere black brown; malar space about 1/3 diameter of an ocellus; temple and postocellar area densely punctured, interspaces not broader than diameter of a puncture. Male. China (Guizhou)..... *S. melanogaster* Niu & Wei **sp. nov.** (Figs. 2A, 4K, L)
- 11. Head black, clypeus, labrum, basal part of mandible and sometimes a dot on postocellar area white; pale maculae on abdomen and legs whitish ..... 12
- Temple and orbits largely, posterior part of postocellar area in female yellowish brown; pale maculae in abdomen and legs in both sexes yellow brown..... 13
- 12. Postocellar area with three whitish linear stripes and connected to white posterior margin; area below pore line in middle annuli of female lancet distinctly more than 2 × as long as broad; middle serrulae low and flat with 4–5 distal small teeth, interspaces between serrulae not shorter than nearby serrulae. China (Tibet).....  
..... *S. trilineata* Niu & Wei **sp. nov.** (Figs. 2B, 3K, L)
- Postocellar area black, seldom with a minute white dot; area below pore line in middle annuli of female lancet distinctly less than 2 × as long as broad; middle serrulae oblique and protruding with 9–10 distal small teeth, interspaces between serrulae distinctly shorter than nearby serrulae. China (Yunnan, Tibet); N. Myanmar; N. and N. E. India..... *S. mooreana* Cameron (Figs. 2C, D, 3G, H, 4M, N)
- 13. Base of fore and of middle femora with distinct black maculae; first abdominal tergite largely black. China (Gansu, Shaanxi, Hubei, Sichuan, Hunan, Fujian, Guangxi, Guizhou) .....  
..... *S. grahami* Malaise (Figs. 1F, G, 3E, F, 4E, F)

- . Fore and middle femora entirely yellow brown; first abdominal tergite largely yellow brown ..... 14
14. Hind tibia yellow brown, apical half of forewing infusate; postocellar area as long as broad. China (Yunnan, Tibet)..... *S. dianzangica* Niu & Wei **sp. nov.** (Figs. 1D, E, 3C, D, 4C, D)
- . Hind tibia yellow brown in female and with apical 1/4 black in male, forewing hyaline, hardly infusate at apices; breadth of postocellar area  $1.67 \times$  length in female and  $1.5 \times$  length in male (female based on literature and male based on a non-type specimen). China (Tibet); India (Manipur, Nagaland; Sikkim).....  
..... *S. harpeata* Saini & Bharti (Figs. 1H, 4G, H)

# 1. *Siobla dianzangica* Niu & Wei **sp. nov.**

Female. Body length 10.5 mm (Fig. 1D). Body black; labrum and mouthpart yellowish white, mandible with base black and apex dark reddish brown; outer of temple, upper of orbit, and postocellar area with orange brown macula; apical 4 antennomeres yellowish brown; broad posterior margin of pronotum, tegula, mesoscutellum and posttergite, metascutellum, upper of mesepisternum, most of 1st abdominal tergite, most of 2nd and 3rd abdominal tergites, lateral sides of 4th to 7th abdominal tergites, 8th to 10th abdominal tergites, most of sternites, and sheath yellowish brown. Legs yellowish brown, base of fore coxa, most of middle and of hind coxae black, hind femur black except basal 1/5. Fore wing hyaline, apical 1/3 infusate, stigma and most of vein black brown, base of vein C brown; hind wing hyaline, slightly infusate towards apex. Hairs on dorsum of head and thorax silver brown, hairs on pleuron silver.

Punctures on clypeus large and sparse, interspaces shiny; frons densely punctured, microsculptured, upper and middle of inner orbit densely punctured, with narrow interspaces; punctures on temple apart, shining interspaces usually equal to or larger than puncture diameter, shining interspaces on postocellar area narrower than puncture diameter on it, anterior of prescutum and of scutum densely punctured, elevated posterior of prescutum sparsely punctured, anterior slope of mesoscutellum and scutellar appendage impunctate, posterior slope of mesoscutellum and metascutellum densely punctured, rest of mesonotum minutely and sparsely punctured; upper half of mesepisternum densely punctured, with very narrow interspaces, lower half with shallow and sparse punctures; anterior and posterior of katepimeron shiny; upper half of metepisternum minutely and densely punctured, matte, metepimeron shiny except for dorsum densely and coarsely punctured. Abdomen tergites shiny, lateral sides of 1st abdominal tergite punctured, lateral sides and posterior margin of 4th to 9th tergites shallowly and sparsely punctured.

Hairs on dorsum of head as long as transverse diameter of median ocellus; hairs on mesepisternum slightly longer than transverse diameter of median ocellus. Anterior margin of clypeus truncate; malar space as long as transverse diameter of median ocellus; head in front view with eyes converging below, lower interocular distance  $1.25 \times$  longest axis of eye; anterior margin of supraantennal tubercle elevated, posterior confluent with frontal ridge; middle fovea shallow and broad, without middle longitudinal furrow, lateral fovea deep; interocellar furrow narrow, postocellar furrow broad and shallow; postocellar area slightly elevated, lower than top of ocelli, about  $1.7 \times$  as broad as long; lateral furrows deep and straight, slightly divergent posteriorly; head behind eyes  $0.7 \times$  eyes in length in dorsal view, convex at base and narrowing posteriorly. Antenna filiform, subequal to vein C of fore wing, or head, thorax and 1st abdominal tergite combined, 2nd antennomere broader than long, scapus  $1.7 \times$  as long as pedicel, 3rd antennomere  $1.5 \times$  as long as 4th antennomere, 8th

antennomere  $2.5 \times$  as long as broad. Middle furrow on prescutum shallow; Mesoscutellum acutely slightly elevated; distance between cenchri about  $2 \times$  as long as breadth of one. Hind inner tibial spur  $0.5 \times$  length of metabasitarsus, metabasitarsus  $5 \times$  as long as broad, about as long as remaining 3 tarsomeres combined; tarsal pulvilli narrow, 2nd pulvillus slightly shorter than apical breadth of 2nd tarsomeres, distance between basal two pulvilli  $2 \times$  as long as length of 1st pulvillus, distance between 2nd and 3rd pulvilli slightly longer than 2nd pulvillus. Ovipositor sheath  $0.9 \times$  length of middle tibia, apical sheath  $1.4 \times$  as long as basal sheath; lancet with 16 serrulae, as in Fig. 3C, middle serrulae slightly oblique and protruding, each with 11–13 fine subbasal tooth, as in Fig. 3D.

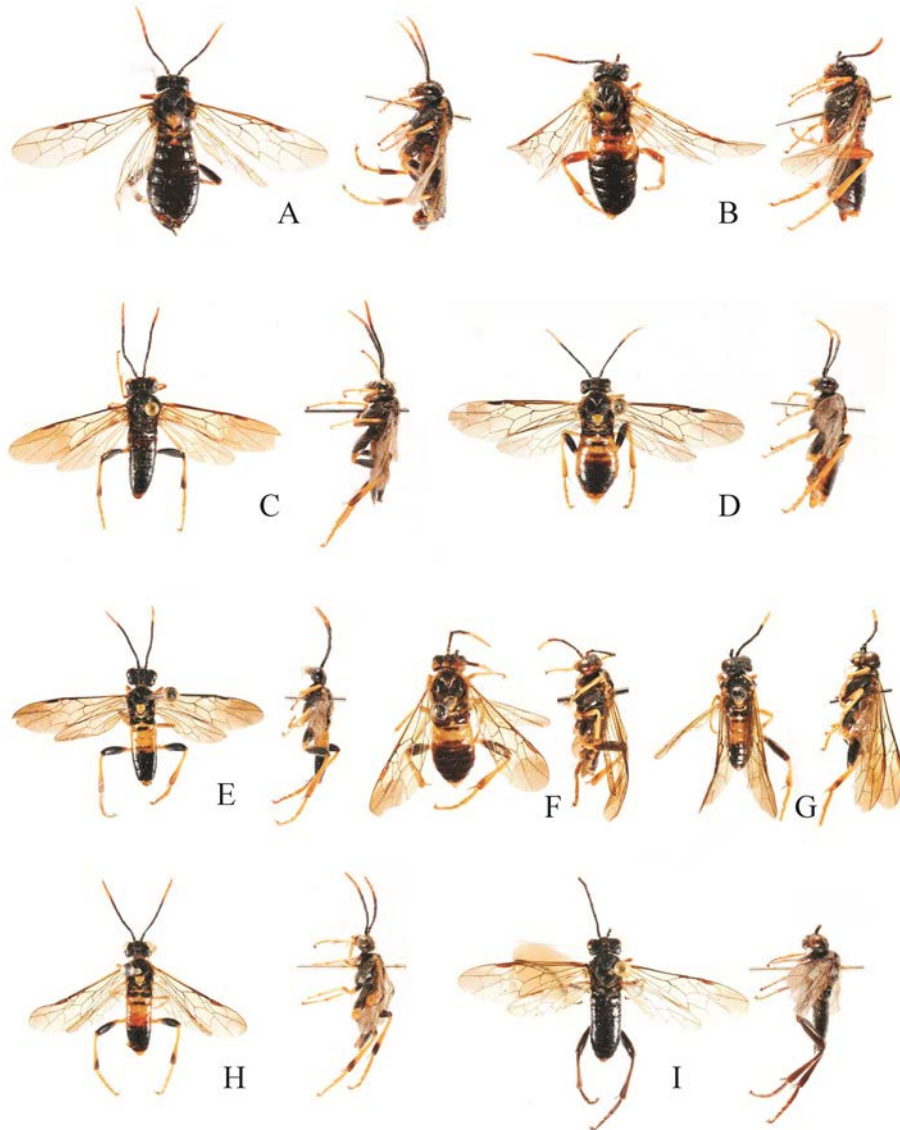


Figure 1. Adults of *Siobla* species. A. *S. bengalensis*, ♀; B. *S. darjilingia*, ♀; C. *S. davidi*, ♂; D. *S. dianzangica* sp. nov., ♀; E. *S. dianzangica* sp. nov., ♂; F. *S. grahami*, ♀; G. *S. grahami*, ♂; H. *S. harpeata*, ♂; I. *S. indica*, ♂.

Male. Body length 10.0 mm (Fig. 1E). Body black; clypeus, labrum, middle of mandible, apical 3 antennomeres, small spot on the middle of posterior of postocellar area, posterior margin of pronotum, tegula, mesoscutellum and scutellar appendage, metascutellum, most of 1st abdominal tergite, entire of 2nd and 3rd abdominal tergites, most of 4th abdominal tergite and 2nd to 4th abdominal sternites yellowish brown; color of legs similar to female, but basal 0.3 of hind femur reddish brown; structure similar to female but malar space linear, lower interocular distance  $0.87 \times$  longest axis of eye, head behind eyes equal to half of eye, distinctly narrowing posteriorly; subgenital plate as long as broad, apex round, genitalia as in Figs. 4C, D.

Variation. The single female paratype is darker than the holotype, abdominal tergites black, except for most of the 1st tergite and of the 2nd tergite, the lateral sides of the 3rd to the 5th tergites, the lateral sides of the 8th tergite and most of the 9th tergite yellowish brown. In the seven males, the size of the maculae on the 1st abdominal tergite varies; the small spot on the postocellar area absent in two males.

**Holotype.** ♀, **China**, Yunnan, Houqiao Town, Tengchong County, 25.3665°N, 98.2110°E, 2196 m, 01-VI-2009, Meicai WEI, KCN (ASC). **Paratypes.** 1♂, **China**, Tibet, Daxiagu, Pailong Town, 30.0196°N, 94.9972°E, 2054 m, 15-VI-2009, Gengyun NIU, ethylacetate; 1♂, **China**, Tibet, Daxiagu, Pailong Town, 30.0196°N, 94.9972°E, 2054 m, 16-VI-2009, Meicai WEI, ethylacetate; 2♂, Linzhi City, 30.0091°N, 95.9707°E, 2572 m, 12-VI-2009, Meicai WEI & Zejian LI, KCN; 5♂, Pailong Town, Linzhi City, 30.0196°N, 94.9972°E, 3740 m, 16-VI-2009, Meicai WEI & Gengyun NIU, KCN; 1♀, **China**, Yunnan, Zhedongzhan, Mt. Ailao, 24.0322°N, 101.3620°E, 2015 m, 20-VII-2006, Qing YANG, KCN.

Distribution: China (Tibet, Yunnan).

Etymology. The specific epithet refers to the type localities. The “dian” is a Chinese abbreviation of Yunnan, and “zang” is a Chinese abbreviation of Tibet.

Remarks. This new species is similar to *S. grahami*, but differs from the latter by the following: most of the 1st abdominal tergite, and entire of fore and middle femur yellowish-brown in both sexes; tegula entirely yellowish-brown in the male; in the female, head behind eyes  $0.7 \times$  eyes in length in dorsal view; middle serrulae with 11 to 13 subbasal teeth. While in *S. grahami*, most of the 1st abdominal tergite black, at least base of fore and middle femur blackish-brown in both sexes; tegula entirely black in the male; in the female, the head behind eyes  $0.6 \times$  eyes in length in dorsal view; middle serrulae with 8 to 9 subbasal teeth.

## 2. *Siobla melanogaster* Niu & Wei sp. nov.

Male. Body length 10.5 mm (Fig. 2A). Body black, apical half of clypeus, labrum, basal half of mandible, apical 3 antennomeres and apex of 6th antennomere, posterior margin of pronotum, mesoscutellum and posttergite, metascutellum, middle spot on posterior of 1st abdominal tergite, lateral spot on 2nd abdominal tergite, yellowish white. Legs black, dorsum and apical half of anterior of fore femur, apical spot of middle femur, fore and middle tibiae largely, hind trochanter largely, basal 1/3 of hind tibia, 2nd to 4th hind tarsi, and 5th hind tarsus, yellowish white. Fore wing hyaline in basal half, and infusate towards apex; hind wing sub-infusate towards apex; stigma and veins blackish brown. Hairs silver brown.

Punctures on clypeus and temple dense, shining interspaces shorter than diameter of punctures; frons densely punctured; inner orbit densely punctured, with very narrow

interspaces; mesoscutum densely and minutely punctured, posterior of prescutum sparsely punctured, interspaces shiny; anterior slope of mesoscutellum and posttergite impunctate, posterior slope of mesoscutellum and metascutellum coarsely punctured; upper half of mesepisternum densely punctured, with very narrow interspaces, lower half with shallow and sparse punctures; anepimeron punctured and microsculptured; anterior and posterior of katepimeron shiny, middle basin microsculptured; upper half of metepisternum minutely and densely punctured, matte, metepimeron shiny except for dorsum densely and coarsely punctured. Abdominal tergites shiny, lateral sides of 1st abdominal tergite punctured, lateral sides and posterior margin of 3rd tergite, and most of 4th to 9th tergites shallowly and sparsely punctured.

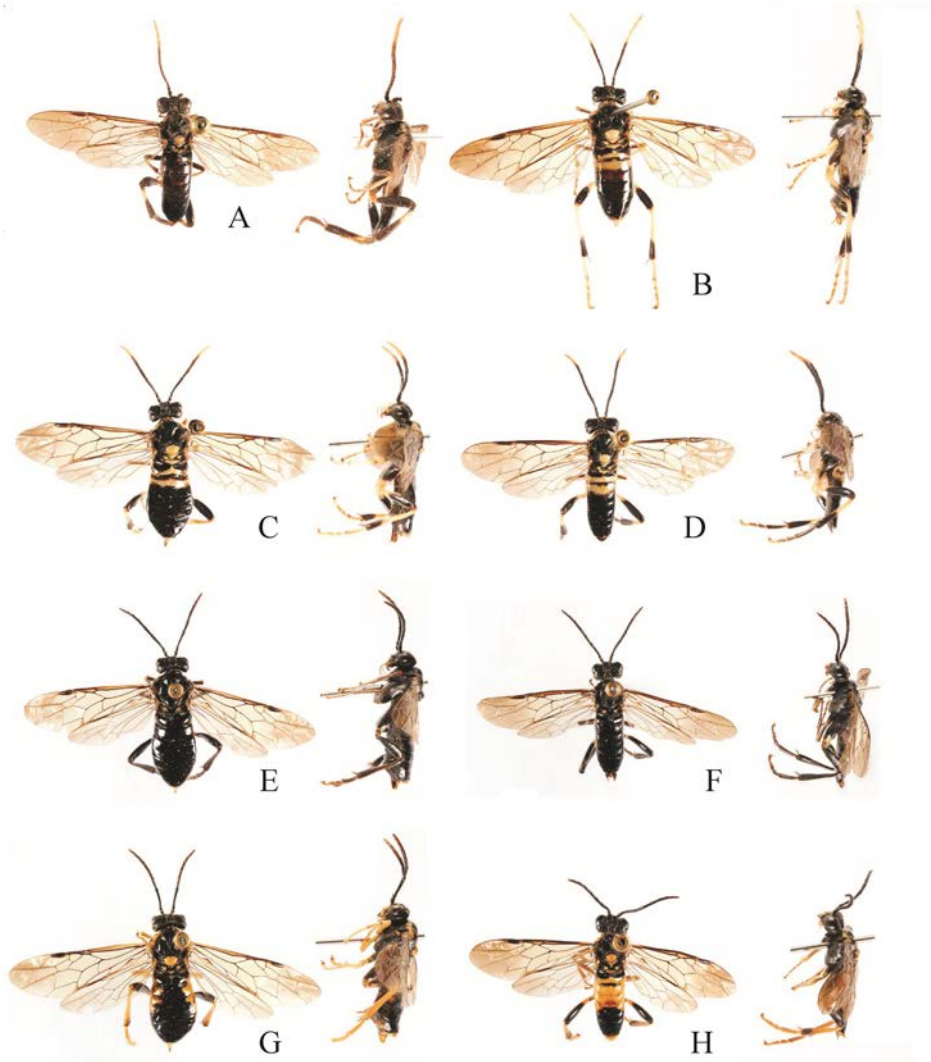


Figure 2. Adults of *Siobla* species. A. *S. melanogaster* **sp. nov.**, ♂; B. *S. trilineata* **sp. nov.**, ♀; C. *S. mooreana*, ♀; D. *S. mooreana*, ♂; E. *S. punctata*, ♀; F. *S. punctata*, ♂; G. *S. turneri*, ♀; H. *S. turneri*, ♂.

Hairs on dorsum of head straight, as long as transverse diameter of median ocellus; hairs on mesepisternum curved, slightly longer than transverse diameter of median ocellus. Anterior margin of clypeus truncate; malar space  $0.3 \times$  transverse diameter of median ocellus; head in front view with eyes converging below, lower interocular distance as long as longest axis of eye; middle fovea round, without middle furrow, lateral fovea deep; interocellar furrow short and shallow, postocellar furrows narrow and deep; postocellar area elevated, as high as top of ocelli about  $1.4 \times$  as broad as long; lateral furrows divergent posteriorly; head behind eyes  $0.6 \times$  as long as eyes in length in dorsal view, narrowing posteriorly. Antenna filiform, middle compressed, equal to vein C, or head, thorax, and abdominal tergite 1 and 2 combined in length, 2nd antennomere  $1.3 \times$  as long as broad, 1st antennomere  $1.3 \times$  as long as 2nd antennomere, 3rd antennomere  $1.6 \times$  as long as 4th antennomere, 8th antennomere  $2.5 \times$  as long as broad, outer and inner of 5th to 8th antennomeres with furrows. Middle furrow of prescutum distinct, mesoscutellum weakly elevated; posttergite without carinae; cenchri small, distance between them  $2.2 \times$  as long as breadth of one. Inner tibia spur slightly longer than outer one, and half as long as basitarsus; hind basitarsus  $4.6 \times$  as long as broad, and  $1.1 \times$  as long as following 3 tarsomeres combined in length; tarsal pulvilli small. 2nd pulvillus slightly shorter than apical breadth of 2nd metabasitarsus, distance between 1st and 2nd pulvilli  $4.5 \times$  length of 1st pulvillus, distance between 2nd and 3rd pulvilli  $2 \times$  length of 2nd pulvillus. Genitalia as in Figs. 4K, L.

Female. Unknown.

**Holotype.** ♂, **China**, Guizhou, Huaxi District, Guiyang City, 1994 (ASC).

Etymology. The specific epithet is a noun and refers to the black abdomen.

Remarks. This new species is similar to *S. bengalensis* Saini *et al.*, 1985. See the above key for the differences between the two species.

### 3. *Siobla trilineata* Niu & Wei sp. nov.

Female. Body length 12 mm (Fig. 2B). Body black; clypeus, labrum, outer spot on middle of mandible, E-shape macula on postocellar area, apical 4 antennomeres and apex of 5th antennomere, posterior corner and margin of pronotum, mesoscutellum and posttergite, metascutellum, broad posterior margin of 1st abdominal tergite, 2nd tergite, maculae on lateral sides of 3rd and 7th tergites, most of 8th tergite, 10th tergite and sheath white. Legs white, coxa except apical margin, posterior stripes and basal spots on venter of fore and middle femora, apical 3/5 of hind femur, and apical 1/3 of hind tibia blackish brown. Wings hyaline, fore wing infusate beyond middle of stigma, apex of hind wing infusate, stigma and veins blackish brown. Hairs on dorsum of head silver brown, hairs on pleuron silvery.

Clypeus with sparse punctures, interspace obvious, shiny; frons coarsely punctured, interspace microsculptured; middle and upper of inner orbit densely punctured, interspace narrow, shiny; punctures on postorbit minute, interspace narrow, shiny; interspace narrower than diameter of punctures on postocellar area, shiny; interspace as long as diameter of ocelli on temple; anterior of prescutum and apex of scutum densely punctured, posterior of prescutum sparsely punctured, shiny; anterior slope of mesoscutellum and posttergite smooth, shiny, posterior slope of mesoscutellum and metascutellum densely punctured, matte, punctures on rest of mesonotum minute; upper half of mesepisternum densely punctured, interspaces very narrow, lower half with sparse punctures; upper of metepisternum densely



punctured, matte, metepimeron shiny, dorsum of metepimeron coarsely and densely punctured; lateral sides of 1st abdominal tergite with shallow and minute punctures, lateral sides and posterior margins of 4th to 9th tergites with sparse and shallow punctures, rest of tergites shiny.

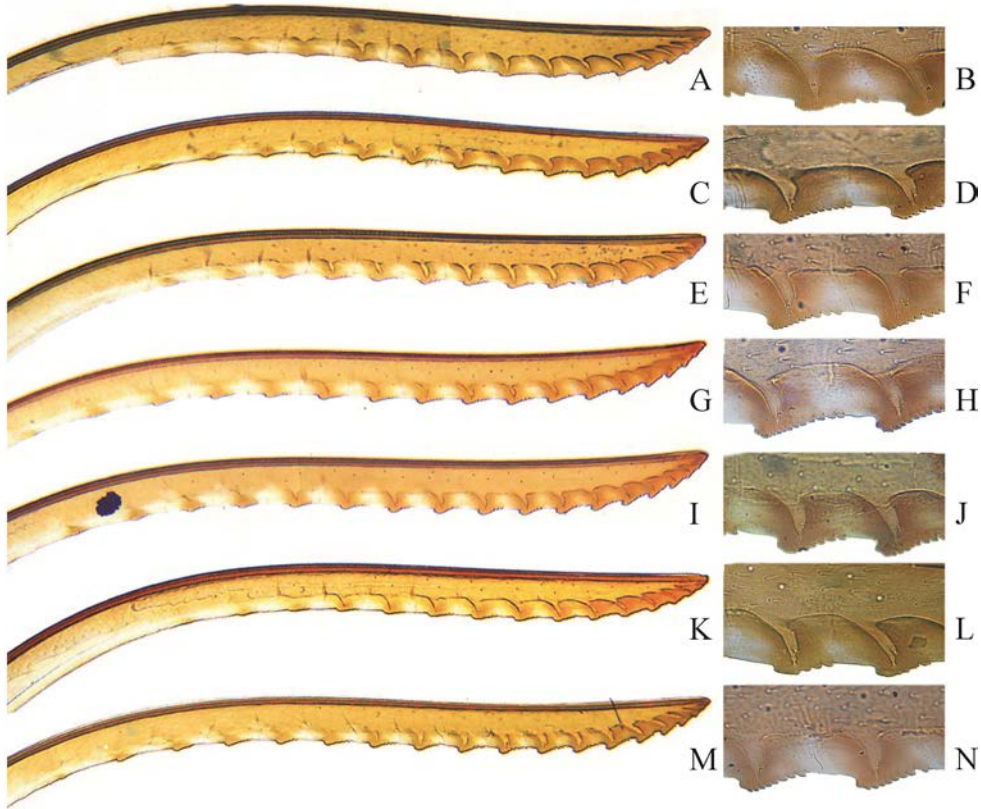


Figure 3. Lance of *Siobla* species. A, B. *S. darjilingia*; C, D. *S. dianzangica* **sp. nov.**; E, F. *S. grahami*; G, H. *S. mooreana*; I, J. *S. punctata*; K, L. *S. trilineata* **sp. nov.**; M, N. *S. turneri*.

Hairs on dorsum of head slightly shorter than diameter of median ocellus, hairs on mesepisternum longer than transverse diameter of median ocellus. Anterior margin of clypeus truncate; malar space as long as transverse diameter of median ocellus; head in front view with eyes converging below, lower interocular distance  $1.3 \times$  longest axis of eye; anterior margin of supraantennal tubercle elevated, posterior confluent with frontal ridge; middle fovea round and broad, lateral fovea deep; interocellar furrow narrow and postocellar furrows broad and shallow; postocellar area elevated, hardly lower than top of ocelli, without middle carina, about  $1.5 \times$  as broad as long; POL: OCL: OOL = 10: 22: 31; lateral furrows deep, curved outwards, divergent posteriorly; head behind eyes  $0.85 \times$  eyes in length in dorsal view, convex at base and narrowing posteriorly. Antenna as long as vein C, and slightly longer than head, thorax and 1st abdominal tergite combined in length; 2nd antennomeres longer than broad, length ratio of scapus and pedicel as 4 : 3, 3rd antennomere  $1.4 \times$  4th antennomere in length,

5th to 8th antennomeres with outer furrow, 8th antennomere about  $2.5 \times$  as long as broad. Middle furrow of prescutum distinct; mesoscutellum elevated, obviously higher than top of scutum, without carinae, distance between cenchrus  $2 \times$  breadth of a cenchrus. Hind inner tibia spur half as long as metabasitarsus, metabasitarsus  $6 \times$  longer than broad, slightly longer than following 3 tarsomeres together; pulvilli of hind tarsus narrow, 2nd pulvillus as long as apical breadth of 2nd tarsomere, distance between 1st and 2nd pulvilli  $2 \times$  length of 1st pulvillus, distance between 2nd and 3rd pulvilli  $1.5 \times$  length of 2nd pulvillus. Ovipositor sheath  $0.8 \times$  length of middle tibia, apical sheath  $1.4 \times$  basal sheath in length; lancet as in Fig. 3K, middle serrulae as in Fig. 3L.

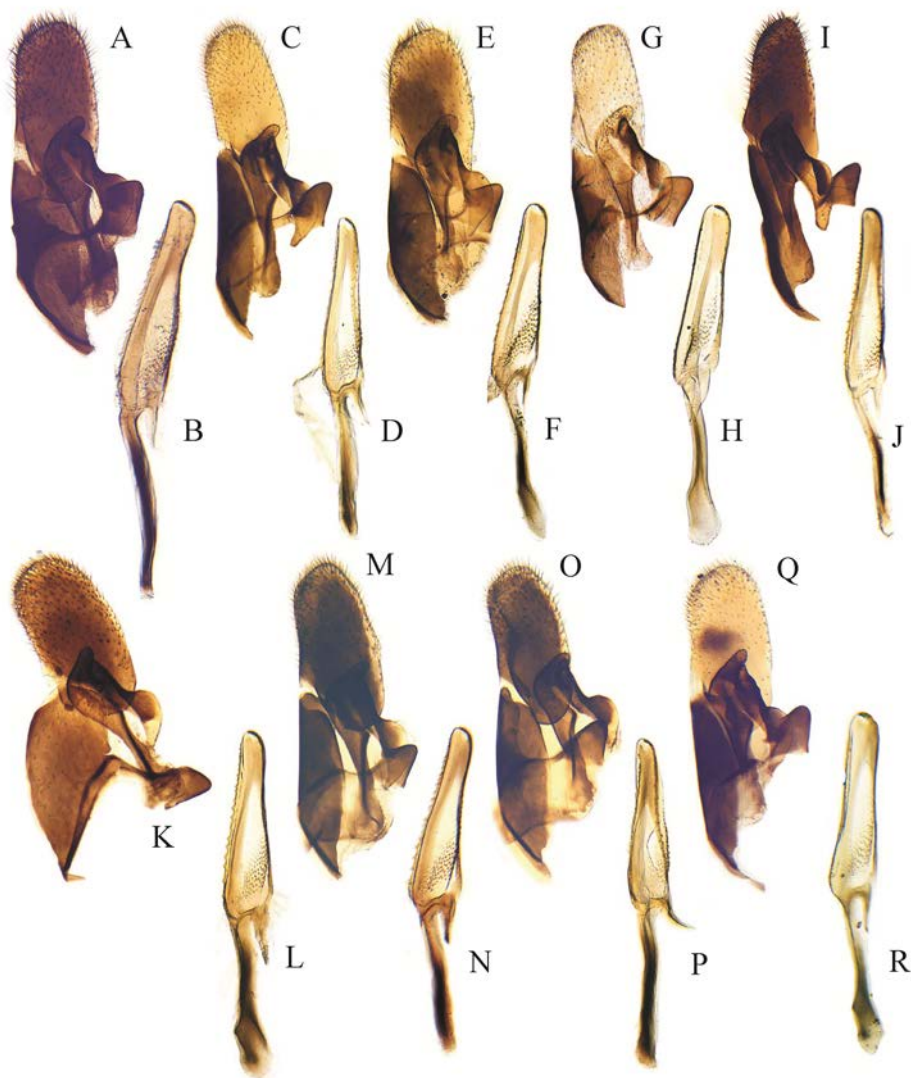
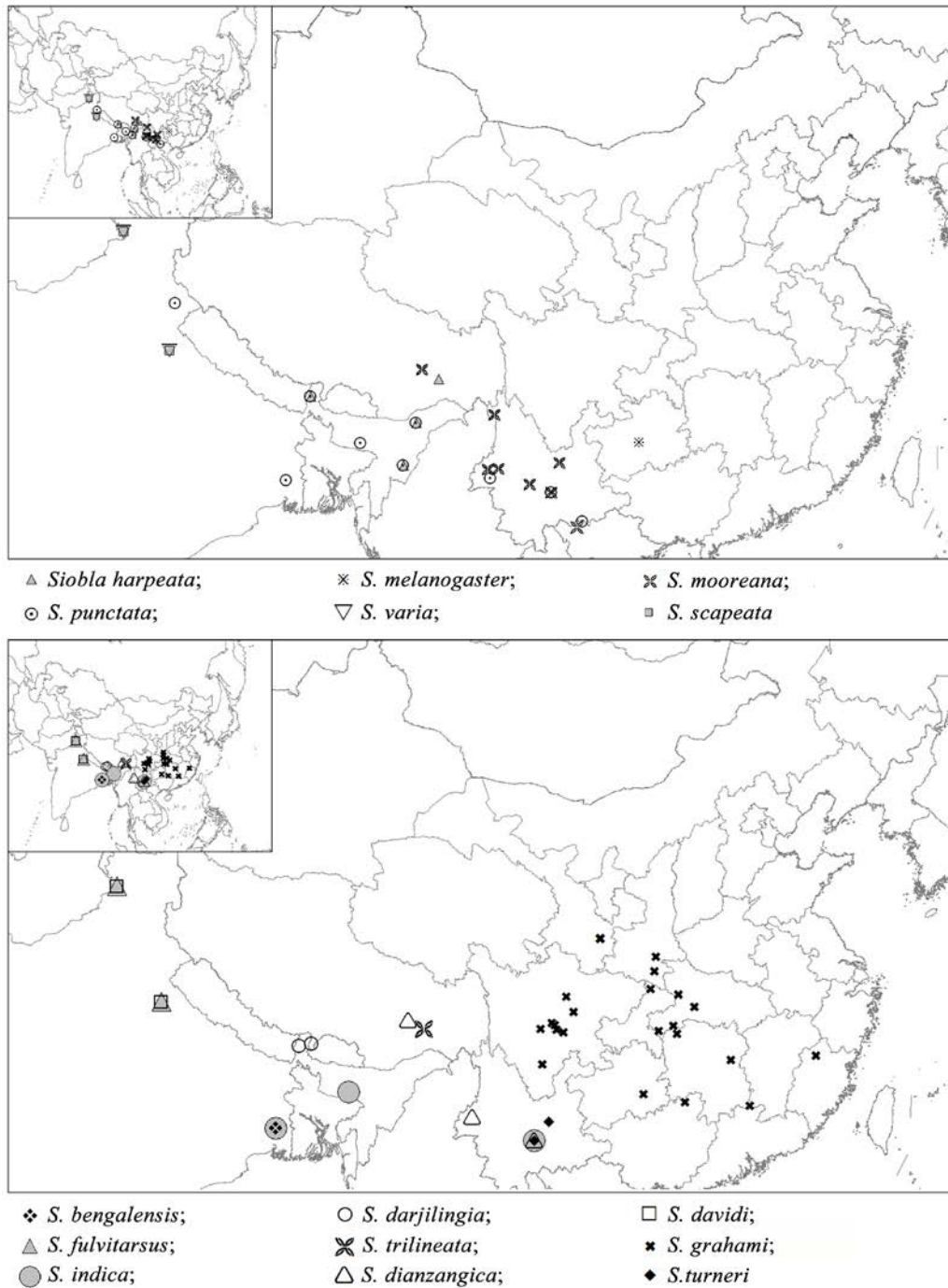


Figure 4. Gonoforcep and penis valve of *Siobla* species. A, B. *S. davidi*; C, D. *S. dianzangica* **sp. nov.**; E, F. *S. grahami*; G, H. *S. harpeata*; I, J. *S. indica*; K, L. *S. melanogaster* **sp. nov.**; M, N. *S. mooreana*; O, P. *S. punctata*; Q, R. *S. turneri*.

Figure 5. Distribution maps of *Siobla grahami* group.

Male. Unknown.

Variation. Body length of female varies within 11–13 mm and the black macula on the apex of hind tibia varies slightly.

**Holotype.** ♀, **China**, Tibet, Mêdog, 80K, 3000 m, 17-VIII-2003, Meicai WEI, KCN (ASC). **Paratype.** 1♀, **China**, Tibet, Mêdog, 80K, 29.6610°N, 95.4919°E, 2021 m, 12-VII-2013, Ping HU & Yihai ZHONG, ethylacetate, ASC-Hym-M00895.

**Etymology.** The specific epithet is derived from the combination of “*tri-*” and “*lineata*” which refers to the special macula on postocellar area of the head.

**Remarks.** This new species is similar to *S. mooreana* Cameron, 1877, but differs from the latter in: the postocellar area with three yellowish-white stripes; mesoscutellum strongly elevated and distinctly beyond the top of scutum; the petiole of the anal cell of hindwing longer than half length of cu-a; (in the latter species the postocellar area is black entirely; mesoscutellum roundly elevated and not beyond the top of scutum; the petiole of the anal cell of hindwing shorter than half length of cu-a).

The interspecific K2P (Kimura 2-parameter) distances for COI ranged from 0.24%–2.18% among the four species of the *S. grahami* group. The K2P distances between this new species (KF939058) and the rest three ones ranged from 0.47%–1.93% (DEIGISHym11974: KC972893) (the highest value may be effected of misnamed or misidentified taxa in GenBank). K2P distances between this new species and *S. turneri* (KF961218) is 0.47%, which is lower than the mean K2P distances in *S. grahami* group (0.73%) and far lower than the mean K2P distances for all species in *Siobla* (unpublished), but the morphological differences between these species are significant.

## Acknowledgments

This research was supported by the National Natural Science Foundation of China (31501885, 31970447). Acknowledgment for the data support from "National Earth System Science Data Center, National Science & Technology Infrastructure of China. (<http://www.geodata.cn>)". Our thanks are due to the anonymous reviewers. The members of the Lab of Insect Systematics and Evolutionary Biology (LISEB) from Central South University of Forestry and Technology are also thanked for their contributions to laboratory work.

## References

- Cameron P. 1899. Hymenoptera Orientalia or contributions to a knowledge of the Hymenoptera of the Oriental Zoological Region. Part VIII. The Hymenoptera of the Khasia Hills. First Paper. *Memoirs and Proceedings of the Manchester Literary and Philosophical Society, Manchester*, 43(3): 1–220.
- Kimura M. 1980. A simple method for estimating evolutionary rate of base substitutions through comparative studies of nucleotide sequences. *Journal of Molecular Evolution*, 16: 111–120.
- Kumar S, Stecher G & Tamura K. 2015. MEGA7: Molecular Evolutionary Genetics Analysis version 7.0 for bigger datasets. *Molecular Biology and Evolution*, 33(7): 1870–1874.
- Malaise R. 1934. Schwedisch–chinesische wissenschaftliche Expedition nach den nordwestlichen Provinzen Chinas unter Leitung von Dr. Sven Hedin und Prof. Sü Ping–Chang. Insekten gesammelt vom schwedischen Arzt der Expedition Dr. David Hummel 1927–1930. 23. Hymenoptera. 1. (In German). *Arkiv för Zoologi*, 27 [1934–1935] (2[nr A9]): 20–26.
- Malaise R. 1945. Tenthredinoidea of South–Eastern Asia with a general zoogeographical review. *Opuscula*

- Entomologica, 4(supplement): 1–288.
- Niu GY & Wei MC. 2010. Revision of the *Siobla annulicornis*, *acutiscutella* and *sheni* groups (Hymenoptera: Tenthredinidae). *Zootaxa*, 2643: 45–65.
- Niu GY & Wei MC. 2013. Revision of the *Siobla formosana* groups (Hymenoptera: Tenthredinidae). *Zootaxa*, 3746(1): 41–68.
- Niu GY, Wei MC & Taeger A. 2012. Revision of the *Siobla metallica* group (Hymenoptera: Tenthredinidae). *Zootaxa*, 3196: 1–49.
- Saini MS & Bharti H. 1996. Replacement names for two species of *Siobla* Cameron (Hymenoptera: Tenthredinidae: Tenthredininae). *Journal of Entomological Research*, 20(1): 377.
- Saini MS & Bharti H. 1999. Two new species of genus *Siobla* Cameron (Hymenoptera: Tenthredinidae) from India and a revised key to the Indian species. *Records of the Zoological Survey of India*, 97: 65–74.
- Saini MS, Blank SM & Smith DR. 2006. Checklist of the sawflies (Hymenoptera: Symphyta) of India. In: Blank SM, Schmidt S & Taeger A (Eds.), *Recent Sawfly Research: Synthesis and Prospects*. Goecke and Ever, Keltern, pp. 575–612.
- Saini MS, Singh D, Singh M & Singh T. 1985. Five new species of *Siobla* Cameron (Hymenoptera: Tenthredinidae) from India with a key to the Indian species. *Journal of the Bombay Natural History Society*, 82(2): 381–387.
- Saini MS & Vasu V. 2000. Taxonomic revision of *Siobla* Cameron, 1877 (Hymenoptera: Symphyta: Tenthredinidae: Tenthredininae) from India. *Russian Entomological Journal*, 8[1999]: 279–291.
- Wu Z. 1995. *Place Names of the Xizang Autonomous Region*. (In Chinese). China Tibetology Research Publishing House, Beijing, 591 pp.